

REMARKS

Applicant respectfully requests reconsideration of this application. Claims 1-10 are pending. Claims 1 and 3 have been amended. Claim 2 has been cancelled. Claims 11-30 are cancelled without prejudice due the previous election of claims in this application. Claims 31-37 have been added. Therefore, claims 1, 3-10, and 31-37 are now presented for examination.

Claim Rejection under 35 U.S.C. §102

Osten, et al

The Examiner rejected claims 1-4 and 6-10 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication 2002/0171144 of Zhang, et al. (“Zhang”).

Claim 1 of the present application, as amended herein, reads as follows:

1. A microelectronic device comprising:

a die, the die comprising a first side, a second side, and an edge;

a first plate, the first plate coupled with the die, the first plate

exerting force on the die to modify the effective coefficient

of thermal expansion of the die; and

a package, the die being coupled with the package.

Among other elements, claim 1 provides that a plate be coupled with a die with “the first plate exerting force on the die to modify the effective coefficient of thermal expansion of the die”. It is submitted that Zhang does not provide for a plate exerting forces on a die to modify its effective coefficient of thermal expansion (CTE).

Zhang describes a grid array package with a heat spreader. (Zhang, e.g. ¶0002)

The head spreader is intended to improve the thermal and electrical performance of a

package. (Zhang, ¶¶0013, 0053) Zhang is concerned with thermal and electrical performance, not with affecting the CTE of the die. In Figure 3 of Zhang illustrates an IC die that is mounted on a package stiffener/heat spreader 304. However, Zhang in no way teaches or suggests that any device or element be used to modify CTE. It is clear from the text of Zhang that the plate shown is operates to dissipate heat and provide stiffness, not to modify thermal expansion characteristics.

Zhang does mention CTE in paragraph 0065, but in a completely different context:

[0065] In an embodiment, stiffener or ring 502 is attached to the top surface of substrate 104. Ring 502 may be attached to substrate 104 by a laminate or adhesive 510. Encapsulant 116 is filled in and flushed to ring 502 after the attachment of ring 502. Ring 502 is preferably made of a metal, such as copper or aluminum, or a combination thereof, but may also be constructed from other applicable materials. *Preferably, ring 502 is made from the same material as heat spreader 504, to minimize the mismatch of the thermal expansion coefficients.* Ring 502 is preferably flush with the outer edges of substrate 104 to form an outer edge of the BGA package, but may also reside entirely within or partially outside an outer profile of substrate 104.

(emphasis added) Zhang is not referring to CTE matching between the package and the die. Zhang is indicating that a ring 502 may be attached to the top surface of the substrate, and that it is preferable to match the CTE of the ring and the heat spreader. Therefore, Zhang is only suggesting that the CTE values of the structures added to the die should match. This has no relevance to the CTE of the die.

For at least the above reasons, claim 1 is not anticipated by Zhang. The remaining rejected claims are dependent claims and are allowable as being dependent on the allowable base claim.

Allowable Subject Matter

The Applicant would like to thank the Examiner for the Examiner's careful search and the finding of allowable subject matter in claim 5. The Examiner has indicated that claim 5 would be allowable if rewritten in independent form.

The subject matter of claim 5 is combined with the subject matter of the previous claims 1 and 4, and is hereby presented as independent claim 31. Dependent claims 32-37 are drawn from the subject matter of claims 2, 3, and 7-10.

Conclusion

Applicant respectfully submits that the rejections have been overcome by the amendment and remark, and that the claims as amended are now in condition for allowance. Accordingly, Applicant respectfully requests the rejections be withdrawn and the claims as amended be allowed.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (303) 740-1980 if there remains any issue with allowance of the case.

Request for an Extension of Time

The Applicant respectfully petitions for a one-month extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136 (a). A check in the amount of \$110.00 is enclosed to cover the necessary fee under 37 C.F.R. § 1.17(a) for such an extension.

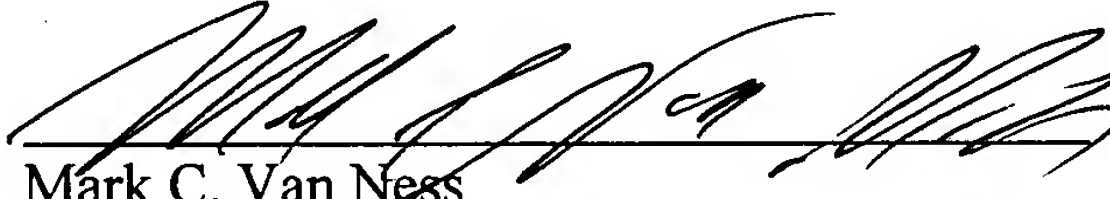
Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

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Date: 10/29/04


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